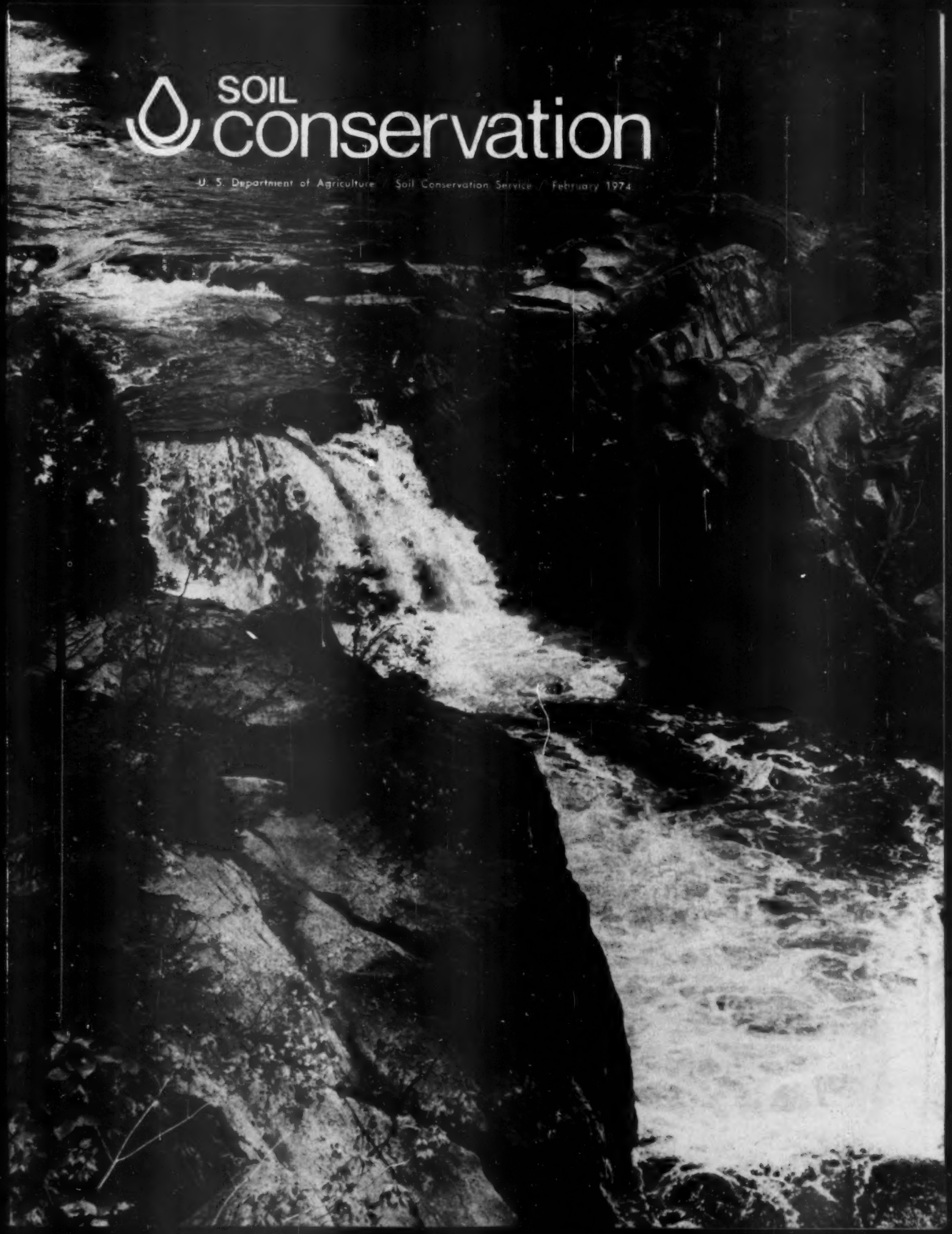

SOIL conservation

U. S. Department of Agriculture / Soil Conservation Service / February 1974

Education — a lifetime job

I recently attended a short course on the environment at the University of Georgia. The course provided a very helpful exchange of views between SCS people and the scientific community on environmental issues, ecology, law, land use planning, stream channel modification, and methods of environmental assessment.

This course and similar ones elsewhere are of great value to SCS people, especially those in policy-making positions. They illustrate something I believe in very strongly—the importance to all of us of continuous educational experiences.

As conservationists we are in the business of helping to make this country a better place in which to live. To do this we must keep up with significant changes and developments in both our own professional disciplines and in the larger national life. The energy shortage, possible food shortages or dislocations, the many conflicting pressures for different uses of our land and water—all of these national concerns have a major effect on the work of the Soil Conservation Service. To meet and successfully grapple with these challenges we must strengthen our skills and gain new insights into our changing society.

Present and future conservationists in SCS must receive the kind of training that will enable them to work effectively with the many private, commercial, and governmental groups interested in the environment. All of us will need to reach far beyond our own professional fields to try and understand those major forces that affect our nation and hence our own effectiveness to the nation.

The intensive short courses some of you have been attending are one form of timely training. The full-time or part-time classroom study that almost 300 SCS people are now undergoing—the great majority on their own time and at their own expense—are a very significant type of education. And, of course, reading and study on one's own initiative, participation in business and professional societies, and on-the-job training are other methods of stretching the mind and improving one's abilities.

The Soil Conservation Service owns no large buildings, no big tracts of land, nor warehouses full of equipment. Our strong suit has always been our skilled, trained people. And our effectiveness—yours, mine, the SCS man or woman in Bangor, Boise, Anchorage, Albuquerque, and points in between—is only as good as our abilities and training.

Any "graduation" from formal education should be considered a base on which to build, rather than a terminal point in which to store our intellectual curiosity. Continuous education of some sort must always be a major part of SCS thinking and experience.

Kenneth E. Grant

SOIL conservation

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COVER: Natural areas like this one in Maine are disappearing fast. Maine's natural areas have been inventoried, and a plan to protect them is being developed. See article on page 16. (Photo courtesy of Robert Cummings, *Portland Press Herald*, Portland, Maine.)

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SOIL CONSERVATION, the official magazine of the Soil Conservation Service, is published monthly by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. Use of funds for printing this publication approved by the Director of the Office of Management and Budget, July 17, 1973.

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Subscription: $5.65 per year, $7.10 foreign. Single copy, 50 cents. Discount of 25 percent on orders of 100 or more sent to same address. Order direct from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

In a Year's Time

Summary of activities of the Soil Conservation Service for fiscal year 1973

In a year's time, the Soil Conservation Service provided 2.7 million technical services for 1.1 million individual land owners and users; helped prepare more than 71,700 conservation plans covering 26 million acres; provided more than 123,000 technical services for 30,433 local and state governments and their agencies; helped improve nearly 10 million acres of land and water for the specific benefit of wildlife; helped prevent $46 million in flood damages through watershed projects . . .

The Soil Conservation Service provides basic resource data and technical assistance for a wide range of community and regional activities aimed at accelerating conservation of soil and water, stimulating economic development, increasing job opportunities, guiding land use changes, improving the quality of rural and urban environments, increasing outdoor recreation facilities, and assisting with other efforts to provide a better life for people.

These services are in addition to the continuing assistance that SCS gives to individual land owners and users in solving their soil and water conservation problems.

SCS's traditional technical assistance to individual land owners, to local conservation districts, to sponsors of watershed projects and resource conservation and development projects, to participants in the Great Plains Conservation Program, and to other organized conservation programs becomes more important as the complexity of conservation, land use, and environmental problems increases.

Resource conservation assistance

In the 38 years that the Soil Conservation Service has been assisting decision makers with their soil and water problems, an interest in better land use and in erosion and sediment control has spread to all segments of our society. Today not only do farmers actively take part in conservation district activities but so do people from all walks of life. We find a diversity of individuals represented in district leadership roles.

Help through conservation districts

During fiscal year 1973, the Soil Conservation Service continued its planning assistance to individual land owners and users and groups that are cooperators with the 2,962 conservation districts throughout the country.

SCS people helped prepare 71,765 conservation plans covering 26.3 million acres and helped revise more than 31,000 plans covering 19.1 million acres. More than 602 million acres of nonfederal land in the United States now are covered by conservation plans that help to insure resource protection and proper land use.

Conservation districts, by the

end of the fiscal year, had 2.2 million cooperators who were applying and maintaining soil and water conservation practices on 778.1 million acres.

SCS recognizes that conservation measures must be carefully planned, installed, and maintained. It provides onsite technical assistance for applying land treatment measures as needed to insure quality control and to implement new techniques. In fiscal year 1973, SCS provided 2.7 million technical services to 1.1 million individual land owners and users in conservation districts.

SCS environmental improvement work for wildlife was impressive in fiscal year 1973. SCS specialists helped land owners across the country improve approximately 9.6 million acres of land and water for the specific benefit of wildlife—a 27 percent increase over 1972. In addition, stripcropping, range improvement, pond building (43,056 in 1973), and other wildlife-benefiting practices were put on millions of acres of land.

More than half a million acres of land were converted to combined wildlife and recreation use in 1973, bringing the total to date to about 12 million acres.

Because of increasing demands for pollution abatement and resource protection, more contractors in the construction of structural measures are seeking assistance from SCS. SCS, Land Improvement Contractors of America, and Farm and Industrial Equipment Institute have teamed up to provide training sessions for contractors. Four training sessions were held in 1973.

Conservation help for units of government

SCS has provided many local and state governments with natural resource information and guided them in its use to prepare plans and programs for making their communities, villages, towns, counties, and states a better place in which to live and work.

In response to public demand for a planned approach to solving land use and environmental problems, many local governments have enacted ordinances that require conservation principles to be incorporated into land development plans. Such plans take into account the suitabilities and hazards inherent in soils.

In fiscal year 1973, SCS provided more than 123,000 technical services to 30,433 local and state governments and their agencies. About 710 local ordinances concerned with land use and erosion and sediment control were put into effect by local governments—an increase of 35 percent over 1972.

Approximately 16,900 natural resource inventories and evaluations were prepared with SCS help. With such information, local units of government can develop quality standards for conservation land use and treatment.

In providing resource information about soil limitations and other site hazards, SCS helped units of government to select more than 2,100 sites for public facilities such as schools, parks,

and hospitals. These facilities contribute much to enriching the quality of life in many communities across America.

Thirty-three states have either held or are planning erosion and sediment control institutes. These provide state leadership with a base on which to develop erosion and sediment control legislation. To date, eight states and the Virgin Islands have enacted such laws and eight others have introduced legislation. SCS provided resource facts that helped the states in formulating this important legislation.

Requests for assistance to the Environmental Protection Agency jumped drastically, which reflects that agency's increasing understanding of SCS's experience in many fields—feedlots, strip mining, construction, solid waste disposal. Requests for the development and review of standards, limitations, regulations, and guidelines were numerous and required an appreciable amount of SCS time.

Watershed protection and flood prevention

During fiscal year 1973, 18 multipurpose dams, 141 floodwater retarding dams, and many other structural as well as nonstructural water management and sediment control measures and practices were installed in Public Law 566 watershed project areas. An additional 40 floodwater retarding dams were constructed during the year in the areas covered by the 11 flood prevention projects which were authorized by an earlier act. All watershed projects include soil conservation measures and land treatment practices for the area.

Some of the older projects were modified to eliminate more than 550 miles of planned channel work and to add ponds, marshes, and other wildlife areas.

Environmental impact statements have been or are being prepared for 85 watershed projects. The process of making careful environmental assessments highlighting the balance between social and economic benefits and environmental values has been strengthened.

In setting up watershed projects, special consideration is given to alternatives that eliminate or greatly reduce anticipated adverse environmental impacts. The use of soil conservation practices plus nonstructural flood plain management measures by themselves or in combination with structural measures is being emphasized. The stress placed on environmental quality and the consideration of alternatives are time consuming but have resulted in better and more comprehensive plans.

During fiscal year 1973, federal assistance in planning or installing soil and water conservation measures was furnished to sponsors of 1,010 watershed projects. Initial agreements for construction were signed for 33 projects in 18 states. In 386 projects, the construction of all engineering measures had been completed by the end of the fiscal year, and in 356 of these projects all planned construction and related land treatment work had been completed.

Twenty-eight applications for watershed assistance were submitted during the fiscal year. To date, planning assistance has been authorized for 1,676 watershed projects.

Emergency watershed protection. In 1973 heavy rains occurred over much of the Mississippi basin in the spring and in the Northeast in June. Congress approved a $20 million supplemental appropriation on July 1, 1973, for emergency measures to protect lives and property from flooding and the effects of flooding, erosion, or sediment. The Soil Conservation Service moved rapidly, working through state and local organizations, to help open clogged watercourses, vegetate critically eroded areas, repair dikes, and install other conservation and protection measures.

By the end of fiscal year 1973, work rectifying damage by Hurricane Agnes was well advanced. Some of the progress is shown below:

Critical area planting	2,062 acres
Dike and levee restoration	300 feet
Spillway restoration	27
Channel debris removal	105 miles
Channel restoration	205 miles
Streambank protection	172 miles

River basin planning. SCS activities in river basin surveys increased in some areas and leveled off or decreased in others.

Fifty-six cooperative studies are in progress in 44 states. Ten of these were initiated in fiscal year 1973.

Environmental information is becoming a greater part of cooperative studies, not only to comply with the National Environmental Policy Act of 1969 and the new Principles and Standards for Planning but also to provide the significant environmental data and perspective necessary for the more detailed levels of planning.

States find cooperative studies useful for meeting their specific objectives in water and land resources planning. For example, a study in Massachusetts is helping to identify valuable reservoir sites.

In Iowa, the Legislature recently divided the state into six conservancy districts, one of which, the Iowa-Cedar Conservancy District, is sponsoring a cooperative study in the Iowa-Cedar

Estimates of benefits gained in 1973 and since the Public Law 566 watershed protection and flood prevention program began.

	1973	Total
Flood damages prevented	$46 million	$317 million
Tons of sediment trapped	1.9 million	18.4 million
Benefits from erosion control and grassland improvement	$67 million	$414 million
Man-years employment from construction	2,830	25,500
Jobs created in new and expanded businesses	6,500	76,000
Reservoirs for municipal and industrial water supply	2	77[1]
Reservoirs with recreation facilities	4[2]	106[3]

[1] Serving 367,000 people in 78 towns.
[2] Providing 31,000 user days per year.
[3] Providing more than 6 million user days per year.

Rivers Basin. The state has requested similar resource studies in each of the other five districts.

In Tennessee, the Governor requested the Obion-Forked Deer Rivers Basin Study, which focuses on a flood plain area where there is controversy over resource use and development.

And in West Virginia, SCS and the U.S. Army Corps of Engineers are jointly studying the Pocatalico River Basin in response to a U.S. Senate Public Works Committee resolution for a plan to meet critical water supply shortages in several rural communities. A joint interim report has been prepared and submitted for Congressional authorization and implementation.

One comprehensive framework study, the Lower Mississipi Regional Study, is currently underway and is scheduled for completion in fiscal year 1974. Eight comprehensive detailed studies are in progress. Two of these, the Hawaii and Connecticut supplemental studies, were initiated in fiscal year 1973, and one, the Red River of the North study in North Dakota and Minnesota, was completed.

Flood hazard studies. The nationwide interest in flood plain regulation and land use planning is creating more and more demand for SCS assistance in flood hazard analyses. In fiscal year 1973, five more states began participating in the flood hazard analyses program, and seven studies were completed. At the end of the year, 23 states were participating and 66 studies were underway.

Flood hazard reports have been published on 13 of the studies. These reports are being used by local communities, counties, and the states as a basis for land use planning and for regulating the use and development of flood plains.

Flood insurance studies. SCS undertook three special tasks for the Department of Housing and Urban Development late in the fiscal year: (1) a type 21 study—listing all flood- or mudslide-prone communities in each state; (2) a type 22 study—acquiring maps of the flood- or mudslide-prone communities in each state (more than 13,500 communities were found to be flood-prone, and a small number of these were also subject to mudslides); and (3) type 7 studies—delineating flood-prone areas on U.S. Geological Survey quadrangle sheets, based on a 100-year flood, using only experienced judgment, soil surveys, and other locally available information.

Total value of all reimbursable studies initiated for HUD in fiscal 1973 was more than $1.5 million. Since July 1969, SCS has been engaged in 155 detailed studies in 37 states and Puerto Rico. At the end of the fiscal year, 127 studies had been completed.

Resource conservation and development projects

During fiscal year 1973, 25 new resource conservation and development projects became eligible for assistance. The 25 new projects are in 26 states: Alabama, Arizona, California, Colorado, Indiana, Kansas, Kentucky, Maine, Michigan, Mississippi, Missouri, Montana, New Jersey, New York, North Carolina, North Dakota, Ohio, Oregon, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, Wisconsin, and Wyoming.

RC&D program assistance at the end of the fiscal year was being provided to 123 projects in 812 counties covering 521,442,000 acres. Nearly 2,100 units of government, including conservation districts, sponsor these projects. All states except Alaska participate in RC&D project activities.

These locally initiated and sponsored projects help to improve the use of an area's natural resources and the economic and social well-being of the people.

In 82 RC&D projects, the initial phases of planning have been completed, and operations have been authorized, enabling the sponsors to receive financial and

In 1973, SCS continued to help farmers and ranchers to increase agricultural production as needed while protecting and preserving the nation's soil and water resources.

technical assistance in carrying out their plans. Sponsors in 20 of the new projects have project plan developments well underway, and most will complete their plans by the end of fiscal year 1974.

In carrying out their RC&D project plans in fiscal year 1973, sponsors adopted 3,519 measures and completed 1,198. Community-type conservation measures completed with RC&D financial and technical assistance included those for erosion and sediment control, flood prevention, public water-based fish and wildlife and recreation developments, land drainage, farm irrigation, educational training, industrial development and expansion, and marketing improvements.

Great Plains Conservation Program

In fiscal year 1973, 2,565 farmers and ranchers signed Great Plains Conservation Program contracts to apply wind and water erosion control measures on 4.3 million acres. Under these contracts, about 21 percent of high-risk lands now used for tilled crops is planned for conversion to grassland.

At the end of the fiscal year, 7,200 unserviced applications for contracts were on file in the 469 counties eligible for participation in the Great Plains Conservation Program. This represents a backlog higher than in any year since program operations began in 1957.

More than 45,100 farmers and ranchers have now entered into long-term contracts covering 81.7 million acres. Of this number, 26,413 contracts have been successfully completed, 2,407 were terminated for various reasons, and 16,330 are still active.

Resource technology development

In fiscal year 1973, there was increased emphasis on providing SCS field personnel with updated knowledge in waste management systems. This included the role of plants, behavior of plant nutrients and pesticides, and management of plants in water management systems.

Work continued on the cause and control of accelerated soil erosion and sediment damage resulting in improved technical information that is applicable to many land uses.

SCS continued to help the nation's livestock producers to grow greater amounts of high-quality forage on native grazing lands to meet the challenge of increasing the number of livestock. Planned grazing systems were started on 6 million acres of rangeland in fiscal year 1973, raising to nearly 44 million acres the amount of grazing land under up-to-date grazing systems. Many reports of 50 to 100 percent increases in rangeland production, with corresponding improvement in erosion-resistant plant cover, indicate the effectiveness of grazing systems that are carefully tailored to individual ranching units.

More than 12 million acres of rangeland was improved by deferred grazing, and 420,000 acres of eroding land was seeded to rangeland plants in fiscal year 1973. Plant cover was improved on about 4 million acres on which invading brush was managed to restore plant community balance, increase sediment control and forage, and improve the quality of wildlife habitat.

As concern for the protection and improvement of natural resources continues to grow, it becomes increasingly important that structural measures — ponds, dams, disposal lagoons, floodwater retarding structures, diversion dikes, channels—be esthetically compatible with surrounding areas.

Incorporating landscape architectural principles in the design of these measures will help to minimize detrimental impacts and at the same time visually improve the areas. To assist in this aspect of design, a landscape architect was added to the staff of the Engineering Division in Washington. Two states also have landscape architects on their staffs.

Agricultural waste management

SCS specialists gave onsite assistance to landowners in the installation of 3,800 agricultural waste management systems during fiscal year 1973. The systems involved lagoons, holding ponds, or waste storage facilities in addition to many conventional soil and water conservation practices. Waste management system construction amounted to about $16 million or 3.1 percent of the cost of all practices installed with CO-O1 assistance. On the basis of the total CO-O1 work force, waste management assistance comprised about 4.2 percent or 390 man-years.

Requests for technical assistance in agricultural waste management are expected to increase rapidly during the next year. Demand already exceeds available manpower in many areas of the country.

Plant materials

The selection of improved plants for grassed waterways and field windbreaks, for use in converting marginal agricultural land to pasture or range, for use as cover crops, and for stabilizing critical areas continued to be an important activity.

Work increased in finding improved plant materials and techniques to solve conservation and environmental problems relative to: the stabilization and beautification of highway banks, recreation areas, housing and industrial developments, and other critical sediment sources; mine spoil reclamation; streambank or pond waterlines protection; sand dune stabilization; solid and liquid waste disposal; slow burning cover for dry brush lands; wildlife food and cover; and beautification.

The following new plants were released by SCS and cooperating agencies and state experiment stations during fiscal year 1973:

'Midwest' manchurian crabapple—for windbreaks, shelterbelts, roadside beautification, and wildlife food and

cover in the Midwestern States.

'Pink Lady' winterberry euonymus—for roadside stabilization and beautification, windbreaks, and wildlife habitat improvement in the southern Great Plains.

'Arriba' western wheatgrass —a variety adapted to the southern Great Plains.

'Redondo' Arizona fescue—for stabilizing ski slopes and other critical areas at high altitudes in the Rocky Mountains.

'Bandera' Rocky Mountain penstemon — a flowering forb for erosion control and beautification along highways.

Woodland. The estimated twofold increase in timber necessary by the year 2000 must be planned 25 years or more in advance. The challenge of "Tree Time USA," a project of the American Foresty Association, is to plant 40 million acres in trees in 10 years. The SCS goal is 5 million acres of trees by 1983.

In fiscal year 1973, district cooperators planted approximately 366,000 acres in trees. This was less than last year mainly because conditions during the planting season were unfavorable and planting stocks were low. All indications, however, point to an increase in fiscal year 1974.

Other accomplishments in 1973 in woodland conservation that will help increase wood crop production were 384,719 acres of woodland improvement and 1,515,762 acres of improved harvesting. The 2,376 miles of field windbreaks that were planted will help increase food production and the 42,418 acres of farmstead and feedlot windbreaks will add to the living comfort of both man and beast.

Surveying and monitoring

During the fiscal year, SCS continued to accelerate its surveying and monitoring work as other agencies and the public became better acquainted with the services that SCS provides.

Snow survey

In fiscal year 1973, 2,412 water supply forecasts were made at 465 locations along western mountain streams. The people living on more than 9 million acres of irrigated land benefited from these forecasts.

The current network for snow measurement and related data includes 1,600 mountain snow courses, 200 aerial markers, 200 soil moisture installations, and 300 mountain precipitation gages. A prototype system of automated sensing devices for data collection and transmittal via radio telemetry has been installed at about 40 sites. In fiscal year 1973, preliminary plans for converting approximately one-third of the manually measured sites to automated sites were completed for each of the 10 Western States.

An agreement was signed with the National Weather Service to permit use of the Geostationary Operational Environmental Satellite (GOES) as a radio relay station for three automated sites. The satellite is scheduled for launch early in 1974.

Soil survey

The Soil Conservation Service provides leadership for the national cooperative soil survey program, whose objective is to provide soil survey information on all of the soils of the United States and the Caribbean Area and to publish this information. A soil survey identifies, describes, classifies, and shows on maps the different kinds of soil. Soil characteristics observed in the field and obtained through laboratory examination of selected soil samples are recorded.

Soil information and interpretations serve as guides for land users in matching use to soil and in determining soil performance under alternative uses.

Soil surveys are made in cooperation with other federal agencies, state experiment stations and other state agencies, county governments, soil and water conservation districts, and other local organizations.

Soil survey operations. In fiscal year 1973, detailed soil survey mapping was completed on about 38.4 million acres; reconnaissance soil survey mapping was completed on about 8.5 million acres. In addition, exploratory soil survey mapping was completed on 63 million acres in Alaska.

The cumulative total for all soil survey mapping completed by the end of the fiscal year was about 1.2 billion acres, or 52 percent of the land in the United States and the Caribbean area.

Soil survey mapping has been completed on an estimated 72 percent of areas in the nation where housing and industry are rapidly expanding.

Soil survey interpretations. In fiscal year 1973, 90 soil survey manuscripts were sent to the Government Printing Office for publication. This is an alltime high. The manuscripts represent 46.9 million acres of mapped land.

Soil interpretations for more than 1,200 soil series from all parts of the country have been entered in computer storage at the Statistical Laboratory, Iowa State University. These data will

Summary of Progress, Fiscal Year 1973

Total reportable progress in soil and water conservation programs assisted by the Soil Conservation Service

Progress item		Fiscal year 1973	Cumulative to June 30, 1973
Conservation plans and related services			
District cooperators	No.	83,235	2,278,927
District cooperators	acres	30,061,970	778,093,166
Recipients of technical assistance	No.	1,127,110	—
Technical services	No.	2,761,088	—
Recipients applying practices	No.	661,431	—
Conservation plans prepared	No.	71,765	1,802,263
Conservation plans prepared	acres	26,382,668	602,814,642
Conservation plans revised	No.	31,015	—
Conservation plans revised	acres	19,154,880	—
Inventories and evaluations prepared	No.	86,728	—
Federal lands in coordinated conservation plans	acres	1,321,929	14,890,266
State and county CNI reports	No.	47	—
Resource planning and implementation			
Services for resource planning	No.	123,554	—
Land use and conservation treatment for units of government	No.	9,517	—
Units of government assisted	No.	30,433	—
Resource plans prepared	No.	1,264	—
Inventories and evaluations for resource plans	No.	16,907	—
Land use regulations established	No.	713	—
Sites for public facility, selected	No.	2,146	—
Sites for public facility, investigated	No.	12,144	—
Group plans, services, and installation plans			
Group conservation plans	No.	3,326	21,219
Group inventories and evaluations	No.	5,053	—
Groups assisted	No.	15,011	—
Services to groups	No.	73,291	—
Groups applying practices	No.	4,613	—
Great Plains Conservation Program			
GP applications received	No.	4,898	52,354
GP applications received	acres	7,510,973	98,289,677
GP contracts signed	No.	2,565	45,150
GP contracts signed	acres	4,332,466	81,681,801
GP contracts terminated	No.	2,981	28,820
GP contracts terminated	acres	4,936,001	48,464,337
Cropland before GP contract	acres	658,465	12,550,465
Planned cropland conversion	acres	169,896	2,651,184
Servicing other USDA programs			
Referrals serviced:			
REAP—Fiscal year	No.	210,735	—
REAP—Program year	No.	—	271,837
Cropland Adjustment Program	No.	29	—
Appalachian Program	No.	638	—
Conservation plans approved	No.	97	—
Water bank program			
Requests for agreement serviced	No.	2,832	—
Plans developed	No.	1,169	1,169
Plans developed	acres	638,941	638,941
Wetland treatment completed in water bank plans	acres	55,740	—

Progress item		Fiscal year 1973	Cumulative to June 30, 1973
Soil surveys			
Detailed soil surveys	acres	38,497,230	811,980,800
Reconnaissance soil surveys	acres	8,498,752	48,108,368
Total surveys	acres	46,995,982	860,089,168
Exploratory soil surveys	acres	63,000,000	337,516,000
Snow surveys and water supply forecasting			
Snow course measurements	No.	8,010	—
Aerial snow marker readings	No.	1,079	—
Mountain precipitation gage readings	No.	1,884	—
Soil moisture station readings	No.	1,250	—
River stations for which numerical forecasts issued	No.	1,038	—
Numerical forecasts issued	No.	2,412	—
River basin studies			
Flood hazard analyses	No.	5	—
Flood insurance studies	No.	32	—
Watershed and RC&D project measures			
Reservoir-type structure sites:			
Investigated	No.	428	—
Surveyed	No.	830	—
Reservoir-type structures:			
Designed	No.	803	—
Under construction	No.	1,237	—
Flow control structure sites:			
Investigated	miles	627	—
Surveyed	miles	717	—
Flow control structures:			
Designed	miles	784	—
Under construction	miles	1,198	—
Fish, wildlife, and recreation developments (public):			
Surveyed	No.	20	—
Designed	No.	17	—
Under construction	No.	32	—
Services provided on land rights, agreements, and contract awards	No.	25,356	—
Recreation developments			
Land owners and operators:			
Establishing first commercial enterprise	No.	1,569	70,024
Expanding or adding to recreation enterprises for primarily commercial use	No.	1,130	—
Changing to recreation enterprises as primary source of income	No.	132	14,193
Changing to recreation enterprises as primary source of income	acres	44,569	2,425,544
Establishing, expanding, or adding to recreation developments for primarily noncommercial use	No.	31,007	649,657
Establishing, expanding, or adding to public recreation developments	No.	570	46,103

Summary of Progress, Fiscal Year 1973—Continued

Total reportable progress in soil and water conservation programs assisted by the Soil Conservation Service

Practice		Fiscal year 1973	On the land—June 30, 1973
Bedding	acres	27,450	781,983
Brush control	acres	4,076,506	53,533,920
Burning, prescribed	acres	513,362	4,824,424
Chiseling and subsoiling	acres	695,103	9,043,648
Clearing and snagging	miles	491	7,667
Conservation cropping systems	acres	20,544,209	211,277,128
Contour farming	acres	3,051,248	49,934,937
Critical area planting	acres	157,014	5,073,365
Crop residue management	acres	19,785,547	177,110,223
Dams, diversion	No.	410	22,104
Dams, multiple-purpose	No.	226	7,332
Dams, multiple-purpose	acre-feet	26,689	20,790,669
Debris basins	No.	2,708	77,867
Deferred grazing	acres	12,324,705	84,809,166
Dikes	miles	330	11,990
Disposal lagoons	No.	1,324	5,644
Diversions	miles	2,081	100,752
Drainage field ditches	miles	4,563	189,264
Drainage mains or laterals	miles	5,106	379,751
Drains	miles	21,304	898,382
Farmstead and feedlot windbreaks	acres	42,418	800,487
Fencing	miles	5,545	576,646
Field borders	miles	1,117	46,039
Field windbreaks	miles	2,376	96,082
Firebreaks	miles	3,333	36,837
Fish stream improvement	feet	291,558	2,431,466
Fish ponds, commercial	acres	5,805	78,129
Fish raceways	feet	36,812	417,039
Fishpond management	No.	68,442	691,655
Floodwater diversions	feet	63,796	1,542,386
Floodwater retarding structures	No.	302	11,606
Floodwater retarding structures	acre-feet	182,174	6,126,281
Floodways	feet	38,561	4,346,221
Grade stabilization structures	No.	9,834	234,338
Grassed waterways or outlets	acres	94,787	2,079,785
Grazing land mechanical treatment	acres	17,676	1,415,216
Heavy use area protection	acres	3,295	174,225
Hedgerow planting	miles	385	23,966
Hillside ditches	miles	63	3,108
Holding ponds and tanks	No.	2,552	6,386
Irrigation canals or laterals	miles	209	58,167
Irrigation ditches and canal lining	miles	807	35,377
Irrigation field ditches	miles	1,328	133,268
Irrigation pipelines	miles	4,520	95,291
Irrigation pits or regulating reservoirs	No.	998	49,679
Irrigation storage reservoirs	No.	180	41,460
Irrigation storage reservoirs	acre-feet	36,215	8,342,001
Irrigation systems, sprinkler	No.	4,673	136,501
Irrigation systems, sprinkler	acres	412,026	8,773,972
Irrigation systems, surface and subsurface	No.	5,322	170,423
Irrigation systems, surface and subsurface	acres	559,148	16,481,315
Irrigation systems, tailwater recovery	No.	1,201	17,985
Irrigation water management	acres	3,362,801	22,313,923
Land grading, drainage	acres	44,791	569,586
Land leveling, irrigation	acres	241,035	11,899,150
Land smoothing	acres	184,321	7,591,329
Livestock exclusion	acres	739,562	29,483,423
Minimum tillage	acres	2,441,882	14,377,013
Mulching	acres	57,793	1,002,869
Open channels	miles	503	16,419
Pasture and hayland management	acres	11,412,082	69,432,872
Pasture and hayland planting	acres	3,212,386	73,494,560
Pipeline	miles	2,635	36,432
Planned grazing systems	acres	6,395,890	43,702,526
Ponds	No.	43,056	1,923,001
Proper grazing use	acres	53,820,200	272,318,948
Pumping plants for water control	No.	2,789	101,698
Range seeding	acres	420,114	16,599,907
Recreation area improvement	acres	57,631	1,294,005
Recreation land grading and shaping	acres	16,334	548,714
Recreation trails and walkways	miles	632	11,167
Roads, access	miles	2,387	26,514
Spring developments	No.	3,333	138,055
Stock trails and walkways	feet	294,324	21,685,354
Streambank protection	miles	514	9,420
Stream channel stabilization	miles	48	1,093
Stripcropping	acres	402,049	22,634,604
Structures for water control	No.	48,995	2,131,653
Terraces, basin	miles	178	2,537
Terraces, gradient	miles	6,630	724,396
Terraces, level	miles	4,307	437,236
Terraces, parallel	miles	3,976	83,580
Total terraces	miles	15,091	1,247,749
Toxic salt reduction	acres	40,720	1,600,441
Tree planting	acres	366,324	20,318,210
Troughs or tanks	No.	11,141	550,926
Waterspreading	acres	67,427	1,216,595
Wells	No.	8,418	603,656
Wildlife upland habitat management	acres	9,106,928	52,070,944
Wildlife watering facilities	No.	1,035	30,605
Wildlife wetland habitat management	acres	539,166	6,065,442
Woodland direct seeding	acres	17,025	680,446
Woodland improved harvesting	acres	1,515,762	32,637,379
Woodland improvement	acres	384,719	16,121,892
Woodland pruning	acres	18,250	184,405
Woodland site preparation	acres	255,662	4,901,575
Land treated			
Land protected during development	units	848	6,946
Land protected during development	acres	24,417	217,107
Land adequately treated	acres	32,712,703	—
Land adequately protected	acres	—	1,187,323,539
Land use conversions[1]			
Cropland to grassland	acres	960,195	27,767,567
Cropland to woodland	acres	27,115	2,861,987
Cropland to wildlife-recreation	acres	62,945	1,708,775
Cropland to "other"	acres	71,849	6,773,817
All other uses to cropland	acres	120,604	8,377,296
All other uses (except cropland) to wildlife-recreation	acres	579,469	9,937,357

[1] Conversions on the land, June 30, 1973, are estimates of conversions since July 1, 1962.

be tied into the Conservation Needs Inventory (CNI) data to make the CNI more useful. In addition, tables for soil survey manuscripts are being produced from interpretation data on a trial basis and will be available for general use soon.

Some states are using automatic data processing systems, such as MIADS (Map Information Assembly and Display System), for producing interpretive maps by computer. These computer printed maps are useful to area and regional planners in making decisions and in informing the public about soil related problems.

Soil survey investigations. SCS maintains soil survey investigation units at its four technical service centers. Soil survey laboratories in these units performed 33,000 individual analyses of physical, chemical, and mineralogical properties of soils during fiscal year 1973.

About one-half of this work consisted of selected analyses on individual soil samples to answer questions on soil classification and interpretation. The other half consisted of comprehensive characterization of complete soil profiles.

A system of computer storage of these data is being developed by SCS to make them more readily available.

The soil survey investigations units continuously strive to develop more useful and more relevant information. Currently, work is underway on methods for characterizing water movement in the soil and on studies on the amounts and the movements of phosphates and other potential pollutants.

Cartographic operations. The Cartographic Division completed 3.5 percent more work covered by CO funds and 11 percent more recoverable work in fiscal year 1973 than in fiscal year 1972.

Map manuscript compilations for 90 soil surveys were completed and sent to the Government Printing Office for publication.

Photobase map sheets for the published soil surveys are obtained from high-altitude photography for areas of low relief. Orthophotography is required in areas of excessive relief if the publication scale is to be 1:20,000 or smaller. SCS contracted with the U.S. Geological Survey for this work. Use of orthophotographic techniques reduces appreciably the SCS man-years required in making mosaics.

During the fiscal year, 135 areas (68,780,800 acres) were contracted for high-altitude photography.

Topographic maps for 127,119 acres were stereoplotted for conservation operations or for use in watershed projects, river basin studies, or resource conservation and development projects. In addition, 5,332 acres were plotted with profile and cross-sections for flood hazard analysis.

The number of conservation plan maps and soil capability maps decreased last year by approximately 20 percent. Conservation resource planning and implementation expenditures exceeded those of fiscal year 1972 by 52 percent—an indication of shifting program emphasis.

Cartographic requirements for RC&D and watershed projects increased more than 50 percent in fiscal year 1973.

Land inventory and monitoring

Each watershed plan, river basin study, resource conservation and development plan, waste water management plan, and national assessment, such as the wetlands inventory and the shoreline erosion inventory, requires factual resource data. Timely and comprehensive data are needed to develop resource use alternatives and to assess the impact of planned activities on the environment.

In 1973, a Land Inventory and Monitoring (LIM) Division was established. The objective of LIM is to provide land owners and users with data on (1) kinds, amounts, and locations of soil, water, and related resources; (2) suitability or limitation of those resources for various uses; and (3) changes and trends in use, extent, and condition of those resources for conservation, development, community planning, and environmental improvement.

Five task forces were assigned to prepare definitions and develop new procedures for surveying, inventorying, and monitoring wetlands, flood plains, prime and unique farmlands, erosion and sediment damages, and soil and water conservation reporting practices.

Accurate data on soil, water, and related resources can give greater authority to land-use policy and assist communities, regions, states, and the nation in land-use planning activities. ♦

One plus one—double cropping grows in the Corn Belt

For the first time in many years, farmers and ranchers in this country are being urged to produce as much as they can. Where will the extra acres for production come from?

In some places, there just aren't any extra acres that are suitable for crop production, so the same acres that produced a crop of red winter wheat or barley are used to produce a second crop in the same year. Much of this land is better protected from erosion than similar land producing only one crop per year.

Double cropping has been used in some areas of the South for years, but technology has been pushing it northward. Improved equipment and chemical weed

Soybeans are proving to be a real bonus as a second crop in the southern part of the Corn Belt, and with no-till planting, soil moisture is saved and every growing day is utilized by the second crop.

by Roy E. Hamilton
Conservation agronomist, SCS
Indianapolis, Indiana

control have been key stimulators.

Proper plant varieties and careful timing of operations are making the second crop a real bonus in the Corn Belt's southern border.

Woodrow McFadin is a farmer in Posey County, Indiana, who has always looked for new and better ideas. A supervisor of the Posey Soil and Water Conservation District since 1970, he is serving as it's secretary. McFadin also sits on the Executive Council of the Four Rivers Resource Conservation and Development Project.

In June 1972, Bob Steele, the Soil Conservation Service's district conservationist at Mount Vernon, suggested that McFadin try double cropping using the no-till method. The farmer was eager. He had grown 52 acres of Arthur wheat, which yielded 50 bushels per acre, and had plowed 40 acres of the wheat stubble for beans. Extremely dry weather late in May and in June had made plowing doubly difficult. "We had to go very slowly because the automatic breakaway would trip," McFadin said. "We disked and cultipacked the field three times before planting."

McFadin hired Lester Pfeiffer, a neighbor owning a no-till planter, to custom plant the 12 acres that remained unplowed.

On June 29 and 30, both the plowed and unplowed fields were planted to Culver soybeans at the rate of 2 bushels per acre. The soil was so dry that 50 gallons of water per acre were applied during planting to encourage germination.

Both fields had received similar management practices over the past several years, and for the soybeans they received the same fertilizer and herbicide treatment.

Beans in the plowed field were rotary hoed twice and cultivated once; the no-till beans received no further care until harvest.

Combining revealed the results. The plowed field yielded 17 bushels of soybeans per acre, and the no-till field yielded 23 bushels per acre. "I won't plow any more wheat stubble," said McFadin.

McFadin's success convinced him to go entirely to no-till double cropping in 1973. He asked Pfeiffer to plant his entire 175 acres of wheatland to double-crop beans. But, because early wet weather forced a late planting season, Pfeiffer could not find time to do the planting. Nor could McFadin find anyone else—the weather had put everybody behind in their work.

McFadin began looking for a no-till planter to buy. By the time he found one in Illinois, he had lost more than 2 weeks of optimum planting time.

Even with late planting, McFadin's crop was a success. He harvested 45 bushels per acre of wheat. He followed the same treatment program of the previous year on his beans, but hail severely damaged 75 acres. The yield was only 13 bushels per acre. The remaining 100 acres averaged 26 bushels per acre, even though the weather had turned dry during part of the growing period.

Many other examples of success with no-till double cropping stand out in the Corn Belt. More and more farmers are finding that plowing for a second crop is a self-defeating exercise. Plowing not only is time consuming, but it is also a soil drying operation. In many areas, the heaviest rains occur in midsummer when newly plowed soil is exposed to erosion.

With no-till planting, soil moisture is saved and every growing day is utilized for the second crop. Many farmers are planting the second crop the same day that the first crop is harvested. Soil is protected against erosion by the small grain root system and straw mulch left after harvest.

Double cropping is growing in the Corn Belt. And the no-till method of double cropping is winning favor as farmers learn how they can produce more with less cost, less time, and less soil loss. ♦

Maine's way of maintaining her natural areas

by **Robert Wengrzynek**
Soil conservationist, SCS
Auburn, Maine
and Herbert Hartman
Natural areas coordinator
Natural Resources Council
Augusta, Maine

Natural areas are examples of the dwindling number of places in our country where outstanding qualities or processes of nature operate relatively undisturbed. Archeological and historical sites share this concept because of their uniqueness.

More than 2,000 natural areas in Maine have been inventoried and evaluated by the Natural Resources Council (NRC) of that state. Computerized information is available, through Maine's eight planning districts, for planning municipal land use and making zoning decisions.

The New England Natural Areas Project, of which Maine's NRC is a cooperator, has enabled Maine to formulate protective programs geared to the state's need and to focus public attention on the urgency of a land use policy to aid all of New England.

In the first phase of this project, which is sponsored by the New England Natural Resources Center, the natural areas throughout New England were identified, classified, and described. A comprehensive data base was thus established.

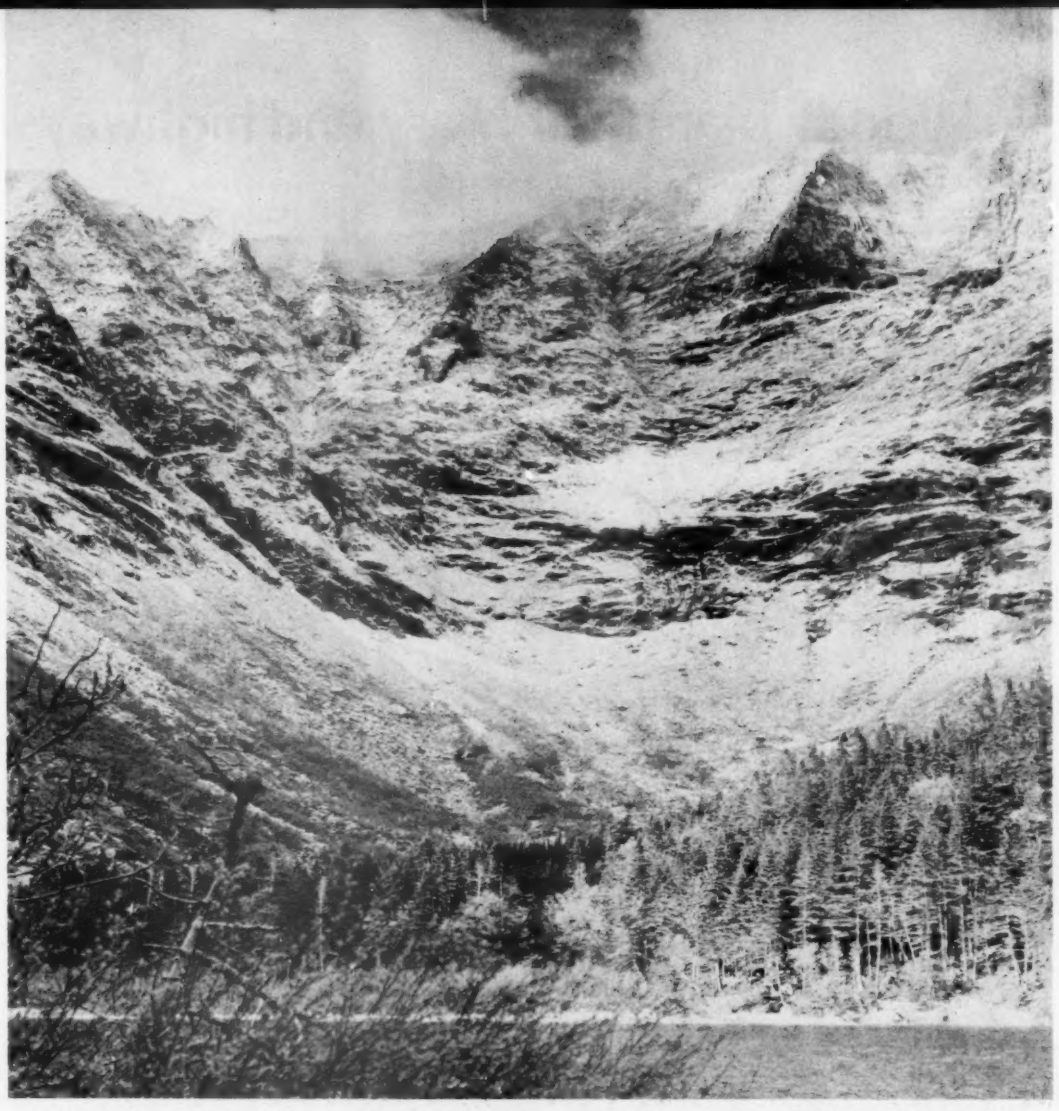
In phase two a regional plan was developed to protect natural areas as major economic, ecologic, and esthetic assets. A study was made of existing natural area protection procedures, and the need for a Natural Areas Advisory Board to assist in planning was established.

Publicity given to natural areas is minimal, and distribution of data is limited to protect the sites, 82 percent of which are privately owned, and the land around them from speculative development. The 18 percent of the sites that are in public ownership also

Reid State Park is one of Maine's natural areas. It needs protection from misuse and overuse.

Classification of Maine's natural areas according to predominant features

Predominant feature	*Number of areas*
Geologic	583
Hydrologic	553
Soils	17
Flora	157
Fauna (Terrestrial Animals)	24
Fauna (Birds)	221
Fauna (Aquatic)	54
Archeological	222
Cultural/Esthetic/ Visual	194
Total	2025



Mountains and lakes of unspoiled natural beauty are among the more than 2,000 places that Maine has designated as natural areas. (Photo courtesy of Robert Cummings, *Portland Press Herald*, Portland, Maine.)

can be easily destroyed by overuse or misuse.

Reid State Park is an example. Public use of the area has contributed to destruction of protective vegetation on the natural barrier dunes. Beach erosion, sediment buildup in a salt marsh, destruction of a public recreation area, and loss of unique wildlife habitat are among the bitter results. Restoration of the park has been proposed as a Time and Tide Resource Conservation and Development Project measure by Maine's Department of Recreation. Reestablishing vegetation and people control can help to restore the area.

Elimination of all natural areas from public use is not the objective of protective consideration. On the contrary, such areas could be enjoyed by the public and used for scientific research, teaching, protection of rare or endangered plants and animals, and preservation of natural and cultural heritage.

The inventory of natural areas is only a beginning. Interest in their protection, whether through municipal zoning, protective acquisition, or conditional approval or disapproval of development by regulating agencies, indicates public awareness and concern for natural resource values. ♦

Woody plants for Maryland highways

Weeping lovegrass and sericea lespedeza protect slopes along the John F. Kennedy Memorial Highway while woody plants become established.

New highway construction and roadway safety improvements are creating thousands of acres of mowable sod right-of-way each year. Maryland annually seeds and mulches 500 to 1,000 acres of disturbed soil on highway projects. At a time when maintenance costs are increasing, this continued planting of a mowable cover is in question.

Seeded roadside slopes will usually deteriorate if not maintained. In the humid East, many small gullies and interspaces of bare soil form on neglected slopes. Woody plant seedlings germinate and become established in the interspaces, but it may take nature 3 to 10 years or more to develop a stand of seedling shrubs or trees in the interspaces.

The cost of planting seedling shrubs and trees on hundreds of acres of highway right-of-way to introduce woody plants is prohibitive. And direct seeding of woody plant material has been tried with little success in a number of states.

In 1966, the Soil Conservation Service's National Plant Materials Center in Beltsville, Maryland, in cooperation with the Federal Highway Administration and the Maryland State Highway Administration, started a program to study effective, economic ways to establish woody plant materials on roadsides.

The cooperative program has two objectives: to find effective and economical methods of establishing low maintenance woody plants on parts of the right-of-way and to present a more varied landscape to the motorist. The overall objective of the program is to reduce maintenance costs on seeded areas and, at the same time, stabilize slopes, control erosion and sediment, and add to the natural beauty of the roadway.

The first task of the project was to compile a list of species considered suitable for trial plantings. Then, for 2 years, the work included testing and selecting species, studying species adaptability, seed treatment and seedbed preparation, testing mulches and mulch anchoring,

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modifying seed mixtures, and improving planting techniques.

Woody plant seeds were hand planted in greenhouses and in cold frames to evaluate stratification and planting depth requirements. Seedling stock performance was evaluated in each of Maryland's three climatic zones.

Hand planting of woody plant seeds on roadside slopes proved valuable in determining seeding rates. A chopped fiberglass and straw mixture proved satisfactory for mulching highly erodible sites, but machinery for applying such a mixture is not yet available.

Either a mulch-anchoring tool or bulldozer tracking is used to incorporate the seed and clean straw or hay mulch. Grass and legume species that leave interspaces free for the establishment of woody plants are being investigated further.

A weeping lovegrass and sericea lespedeza mixture was used in many of the test hydroseedings in areas where woody plants are needed. This mixture proved successful in spring and summer seedings in the Coastal Plain and Piedmont climatic zones. Fall and winter seedings of other species in the Appalachian zone look promising.

Coralberry, false indigo, shrub lespedeza, Japanese bush lespedeza, amur honeysuckle, ninebark, redbud, viburnums, bristly locust, and several species of sumac have been established by direct seeding; these species are still being evaluated.

Red oak has been successfully hand planted on roadside slopes along Maryland's John F. Kennedy Memorial Highway. Five to seven acorns are placed in each shallow planting spot and covered with soil. The plants take up to a year to emerge, depending on the time of planting.

Testing and field studies are still underway on highway slopes in Maryland's three climatic zones. About 100 acres in the three zones have been test-hydroseeded since 1967. Modifying the original seed mixture produced stands of woody plants by direct seeding in the first year. All of the plantings are not fully evaluated but will be before the cooperative project terminates in 1976. ♦

Grass and legume species that allow woody plants, like this seedling of a woody lespedeza, to emerge and become established are being studied along Maryland's highways.

conservation in action

Soil data and sewage disposal

A new approach to onsite sewage-disposal problems has been developed in Vermont's White River Natural Resources Conservation District.

The district inspects proposed sites for sewage disposal and provides towns with data on site conditions and design criteria. Towns can then make decisions and maintain local control.

Governor Thomas Salmon endorsed the program with a comment that it "has the potential for being used on a statewide basis."

The White River Natural Resources Conservation District developed the idea in response to numerous questions about sewage disposal. Assistance was provided by the East Central Vermont Resources Conservation and Development Project.

The Orange County Soil Survey is used as a basis for the technical services that the district provides to towns. Such services ordinarily would be beyond the financial capability of most towns.

Soil, properly used, is one of the most efficient and economical means of sewage disposal. But not all soils are alike. Texture, profile characteristics, drainage, depth, and slope affect the usefulness of soil in sewage disposal.

Orange County soil maps show more than 40 different kinds of soils. Will Sheehan, a Soil Conservation Service soil scientist, has separated these soils into 10 groups. The soils within each group have similar characteristics affecting sewage disposal. SCS, Extension Service, Vermont Departments of Water Resources and of Health, and regional planning and development commissions cooperated in developing a sewage system design for each soil group.

The conservation district is training a new employee to bring this information to towns and individuals. Through contracts with towns, the district furnishes a specialist to do the onsite inspections, supplies design criteria, gives construction assistance, and provides completion checks and periodic maintenance inspections. All of the services are funneled through the town, so the town can maintain control and enforcement responsibilities.

Arthur Hyde, chairman of the White River Natural Resources Conservation District, and his fellow district supervisors, believe the program can solve many of the sewage problems in their district and in the state.—BARRY STRYKER, *area resource development specialist, Vermont Extension Service, Montpelier, Vermont, and* WILLIAM T. STEELE, *district conservationist, SCS, Randolph, Vermont.* ♦

Pear trees, orchardgrass, and Angus cattle

A clamoring flock of guineas announces your entry into the driveway of Richard and Helen Elliott's Pear Tree Ranch in Llanito, New Mexico.

Not so long ago, Llanito was a distinct community. Now, school buildings and houses that have sprung up on each side of Highway 85 make it difficult to distinguish Llanito from the town of Bernalillo.

To Dick and Helen Elliott, retirement means rural living. And they found an ideal spot in Llanito, about 20 miles north of Albuquerque.

After retiring from 24 years of active and reserve service in the U.S. Air Force, Elliott served as information director for the U.S. Atomic Energy Commission in Los Alamos and Albuquerque until he retired again in 1972.

The Elliotts planned their retirement as carefully as they plan other activities. In 1959 they bought 12 acres of irrigated land in Llanito. Mrs. Elliott promptly named it Pear Tree Ranch because of the sturdy pear trees growing there. After building a house, barn, and corrals, the Elliotts were ready to make Pear Tree Ranch their home.

Revamping the irrigated acres became their major activity. In August 1959, Elliott became a cooperator with the Sandoval Natural Resource Conservation District and got help from the Soil Conservation Service in developing a conservation plan for Pear Tree Ranch.

Fields were staked, surveyed, leveled, and planted to fescue, orchardgrass, ryegrass, and clover. Irrigation ditches were relocated and lined with concrete. Metal gates for irrigation were installed. Shade trees, evergreens, and Russian olive were planted in field borders.

Elliott bought purebred Angus cattle to make use of all that grass. Cross fences were installed to divide the 12 acres into 6 separate pastures. Water was piped to each pasture, and drinking tanks were installed.

Elliott soon learned that grass doesn't grow rich and vigorous without some help. And he learned that grass continuously grazed too short becomes weak and unproductive. He learned something about cows too. If allowed, they will graze parts of a pasture almost to the ground, leaving ungrazed clumps to become coarse and unpalatable.

So Elliott started using a rotation grazing system. His herd, averaging 15 grown animals, is kept in one pasture until the grass is grazed to a height of about 4 inches. The cattle are then moved into another pasture or into the feedlot for a few days. Each pasture is rested for 2 or 3 weeks, during which time it is irrigated. But in some years there isn't enough water in the Rio Grande for irrigation, and there are times when sudden rainstorms overload the canal and break its banks. Then, no irrigation is possible until repairs are made.

Irrigating and fertilizing and feeding, grooming, and showing cattle require more time than the Elliotts have. So Pear Tree Ranch provides part-time employment for others. High school boys almost always have first priority for the jobs.

Elliott is a former supervisor of the Sandoval Natural Resource Conservation District. He admits to having a deep love for conservation and gives a lot of credit to his conservation plan for the good life he and his wife have at Pear Tree Ranch.—DICK BARBER, *district conservationist, SCS, Raton, New Mexico.* ♦

Water, water, everywhere

When Sam Kelly bought 8 acres of land on Tripp Road in the Dallas suburb of Sunnyvale, he envisioned the good life in a rural atmosphere—a new house, a barn for his horses, a few cows, and, most of all, a place for his family to enjoy country life.

What Kelly didn't envision was the problem of excess runoff water on his property.

This problem didn't come up until Kelly had almost finished his new house. Then the rains came, and Kelly discovered that his new house was directly in the path of runoff water from his property and adjoining lots.

"My wife called me at work one day," Kelly said, "and all she could say was, 'Sam, there's water everywhere!' " Kelly called the Soil Conservation Service in a hurry. "I had seen a public service spot announcement on television that mentioned assistance was available from SCS on problems such as mine."

After Kelly's meeting with SCS specialists, a plan was worked out to install a diversion terrace to intercept the runoff water. The terrace was designed to empty into a grassed waterway which carries the water to a safe outlet away from the house and surrounding buildings.

Recently, Kelly reported that the terrace and waterway both work well.

"When it rains," Kelly said, "there's still water everywhere, but its in the right place."—R. D. TIDWELL, *soil conservationist, SCS, Dallas, Texas.* ♦

Recon . . .

Ski areas acquitted. Indicted as threatening to the environment at the start of New England's Environmental Symposium on Stream Quality were ski areas and other recreation developments. Participants, however, left the symposium with a conviction that there are many more serious ecological threats. Cited as especially dangerous were paper mills, sand and gravel operations, municipal sewage, highway construction and salting, algae, and logging operations.

Held during two autumn days in Franconia, New Hampshire, the symposium was one of New England's first attempts to join business, conservation, scientific, and public interest groups for knowledge-sharing and discussion of differences.

A USDA representative at the symposium presented evidence from a study conducted near Waterville Valley, New Hampshire, showing only minor, unharmful chemical changes in water from the ski area there.

A new breed of ski developer, active in community affairs, is already here, believes John Christie, owner and general manager of a ski development at Rangeley, Maine. The new breed deems it economically necessary to discourage sloppy secondary development detrimental to recreational value, he said.

Ecology hot lines. The Michigan Natural Resources Department's Environmental Protection Branch has begun a telephone hot line to answer environmental queries. The hot line's recorder system operates 24 hours daily. In Oregon, a "recycling switchboard" was established by the Environmental Quality Department to provide statewide recycling information. In a similar vein, the Illinois Environmental Protection Agency's Speakers Bureau is on the alert to address groups interested in ecology.

"Mini-Ranch and Fun Farming" is the title of a course being taught by SCS retiree Henry Dierking at Community College in Muskegon, Michigan. Dierking designed the class mainly for landowners interested in developing 1- to 50-acre spreads.

First-class soybean soils are: (1) moderately deep to deep; (2) well drained to moderately well drained; (3) medium textured; and (4) on level or gently sloping land where runoff and erosion are minimal. Farmers hoping for above average yields should plant their soybeans in carefully selected soil, says University of Tennessee agronomist George J. Buntley.

Spring a satellite garden. If forced to stay at home this spring because of fuel shortages, many people may turn to gardening in their own yard. Another idea, proposed by Howard Walters in *The American Rose Magazine*, is planting satellite gardens in a variety of territories near home—a vacant lot, an elderly neighbor's yard, a retirement center, a school, a church. Walters stresses obtaining interest and cooperation of appropriate authorities before beginning satellite garden projects. Just think—you might stimulate others to start satellite gardens in their neighborhoods.

Chicken litter reclaims land. Having fertilized northern Arkansas pastures for many years, chicken litter composts are now being used to reclaim southern Arkansas land nearly destroyed by salt wastes from oil wells. Grass planted in a litter compost test plot has done well for three growing seasons. Soil tests indicate the land is effectively reclaimed. Six tons of chicken litter per acre were applied; switchgrass, millet, bahia, bermudagrass, and lespedeza were seeded. Later, the plot was overseeded with fescue and crimson clover.

SCS, Cooperative Extension Service, University of Arkansas Agricultural Experiment Station, and Graduate Institute of Technology studied the salt water waste areas.

They never read an environmental impact statement. Eager beavers are creating problems on some channel clearing projects where SCS is assisting local sponsors. In some places, beavers are rebuilding wooden dams as fast as they are torn out—and using trees marked for preservation in the process.

SOAR, Scouts! The Boy Scouts of America will launch their 1974 Project SOAR (Save Our American Resources) campaigns on Scouting Environment Day, March 23. Energy conservation and recycling of materials discarded as waste are key 1974 SOAR activities. Conservation action and education projects will be continued.

Scouts and Keep America Beautiful, Inc., will join efforts on April 27, which has been designated National Scouting Keep America Beautiful Day. Emphasis on that day will be on improving wildlife habitat, planting trees and shrubs, and cleaning up trash.

Review

New publications

Snow Survey Sampling Guide. *Revised, 1973. USDA Agr. Hbk. 169. 32 pp., illus.* $0.55. This pocket-size training-reference guide is designed for snow surveyors who use snow sampling equipment to measure snow accumulation in mountainous areas of the West. Clearly detailed are sampling and recording procedures for forecasting water supplies and related purposes.

Major Uses of Land in the United States—Summary for 1969. By H. Thomas Frey. *1973. USDA Agr. Economic Rpt. 247. 42 pp., illus. with graphs and charts.* Our country's land area totals about 2,264 million physically diverse acres. Crop and livestock production occurs on about 57 percent of the area. Nearly a quarter is ungrazed forest land. Remaining acres are divided among urban and transportation uses; recreation, wildlife, and other special uses; and essentially unused areas. An inventory of major U.S. land uses as of 1969 is summarized in this report.

Feedlot and Ranch Equipment for Beef Cattle. By D. F. Stephens. *Revised, 1973. Farmers' Bull. 1584. 17 pp., illus.* $0.25. Equipment and shelters essential for successful beef cattle operations are described and illustrated. Pasture or range shelters, feedlot equipment, and corral equipment explained in the pamphlet are designed to be both safe and practical.

Johnsongrass . . . As a Weed. By C. G. McWhorter. *Revised, 1973. Farmers' Bull. 1537. 18 pp., illus.* Brought to this country during the early 1800's for use as potential forage, johnsongrass is now considered one of the world's 10 worst weeds. Growth habits of johnsongrass are described before the author explains cultural control methods, chemical control, and combination methods to suppress the weed.

Controlled Environment Agriculture: A Global Review of Greenhouse Food Production. By Dana G. Dalrymple. *1973. USDA Foreign Agr. Economic Rpt. 89. 150 pp., illus.* $1.50. Since nature is generally master out-of-doors, greenhouse food production may become a way of controlling the environment in agriculture of the future. Long associated with flower production, greenhouses are rapidly developing as food producers. The report does point out that economic, labor, and fuel requirements may handicap this unique form of agricultural production.

Building a Pond. *1973. Farmers' Bull. 2256. 14 pp., illus.* $0.25. This bulletin may help you decide

Meetings

February

10–14 National Association of Conservation Districts, Houston, Texas
20–23 American Camping Association, Atlanta, Georgia
21–22 Southern Forest Institute, Atlanta, Georgia
24–Mar. 1 American Association for the Advancement of Science, San Francisco, Calif.
27–Mar. 1 Land Improvement Contractors of America, Williamsburg, Va.

March

8–13 Associated General Contractors of America, San Diego, Calif.
9–13 Association for Supervision and Curriculum Development, Anaheim, Calif.
10–14 National Farmers Union, Milwaukee, Wisc.
10–15 American Society of Photogrammetry, St. Louis, Mo.
15–19 National Science Teachers Association, Chicago, Ill.
17–22 American Concrete Pipe Association Technical Conference, San Francisco, Calif.
26–28 Agricultural Research Service Water Harvesting Symposium, Phoenix, Arizona
28–31 National Wildlife Federation, Denver, Colo.
31–Apr. 3 North American Wildlife and Natural Resources Conference, Denver, Colo.

April

3–5 Twelfth Annual Symposium on Engineering Geology and Soils Engineering, Boise, Idaho
3–6 National Rivers and Harbors Conference, Washington, D.C.
8–12 American Geophysical Union, Washington, D.C.
28–May 1 Association of American Geographers, Seattle, Wash.

May

12–16 National Council of State Garden Clubs, Inc., Boston, Mass.
19–25 Soil Stewardship Week
20–23 American Institute of Architects, Washington, D.C.

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The Demand and Price Situation for Forest Products, 1972-73. By Dwight Hair and Robert B. Phelps. *1973. USDA Misc. Pub. 1239. 87 pp., illus. with charts and graphs.* Demand for timber products is rapidly growing. Yet, supplies cannot rise significantly unless forest management, utilization, and research programs are stepped up. This publication helps explain 1972-73 trends in production, trade, consumption, and prices of products from our nation's forests.

Field Soil Water Regime. *1973. Soil Science Society of America, Inc., Madison, Wisconsin. SSSA Special Pub. 5, 212 pp., illus.* This volume includes the papers presented at the August 16, 1971, symposium held during the annual meeting of the Soil Science Society of America and American Society of Agronomy. Speakers and subjects reflect a broad spectrum of approaches and research results characterizing the soil water regime.

Four Decades Past the Dust Bowl: The Great Plains Today. *1973. USDA Picture Story 271. 5 pp., illus., foldup.* Like a miracle, the fertile soil, gently rolling hills, and dry climate of the 10 Great Plains states produce food and fiber, making the United States a top agricultural nation. Pictures vividly illustrate the dusty story with a happy ending.

The Outlook for Timber in the United States. *1973. USDA Forest Resource Rpt. 20. 367 pp., illus. with graphs and charts. $3.25.* This report analyzes timber resource supply and demand for the next few decades. It indicates challenges American forestry must face. Demand for timber products is rising much faster than supplies can be grown to meet it. Yet, lands suitable for timber crops must also provide products like recreation, water, and wildlife.